New group leaders at the IPBS Institute, Toulouse, France

Founded in 1996, the Institute of Pharmacology and Structural Biology (IPBS) is a leading research institute of the French National Centre for Scientific Research (CNRS) and the University of Toulouse. Located on the main Campus of the Université Toulouse III-Paul Sabatier in Toulouse, southwest France, the IPBS offers multidisciplinary education in the fields of Science, Health, Engineering and Technology, developing one of the most important scientific research clusters in France.

Our Institute is a world leader in the discovery, characterization and validation of novel important pathways and pharmacological targets in the fields of cancer and infectious diseases, through the use of molecular and cellular biology approaches, together with in vivo experiments. It conducts state-of-the-art research in structural biology, proteomics, biophysics, cancerology, immunology and microbiology (http://www.ipbs.fr). The IPBS brings together more than 250 scientists and supporting staffs, including more than 60 national and international postdoctoral fellows and PhD students. The IPBS offers outstanding scientific and stimulating research environment and several cutting-edge core facilities with highly qualified staff. These include mass spectrometry and proteomics, macromolecular crystallography, liquid- and solid-state NMR, biophysical characterization of proteins and complexes, virtual screening, whole body, tissue and cellular imaging, flow cytometry and cell sorting in standard or BSL3 environments, single particle tracking and tethered particle motion analysis, and animal facilities.

In order to reinforce its research endeavors in an inspiring, collaborative and cutting-edge environment, the IPBS is seeking new talented junior group leaders addressing fundamental questions within the spectrum of its research fields. Young scientists of any nationality, at junior or midcareer level, and with an excellent track record of publications in internationally recognized journals, are encouraged to apply. International experience as well as capacity to interact with other research groups within the institute are highly recommended. Successful candidate(s) will be provided laboratory and office space for 5-8 people, a technical personnel and free access to the institute’s core facilities for a period of 2 years, together with a starting package for basic equipment and consumables. In addition, strong support will be provided from the IPBS to obtain tenured positions at CNRS, INSERM or the University of Toulouse. Outstanding candidates are expected to establish independent and vigorous national and international extramurally-funded research programs (ANR, ERC, etc.) that fit at least with one of the priority topics listed below. Researchers already holding a permanent position are also welcome to apply.

IPBS PRIORITY TOPICS
See full details for each topic at: http://www.ipbs.fr/call2017

- **Tumor microenvironment – Cancer immunology** - Interactions of immune cells with stromal cells, the extracellular matrix and/or other immune cells; immune response to cancer.
- **DNA repair/chromatin remodeling in cancer** - DNA damage response (DDR) in connection with cancer through epigenetics, transcriptional regulation, DNA repair pathologies, chromosomal translocations, DDR-based drug discovery, or tumor resistance to clastogenic agents.
- **Pulmonary infections** - Biology of bacterial respiratory pathogens, with a strong focus on mechanisms underlying pathogen’s persistence, drug resistance or tolerance within the host.
- **Drug discovery & structural biology** - Development of biological and chemical drugs of the future, with the aim of strengthening the pharmacological aspects of the IPBS research framework; characterization of drug-target interactions and mechanism of action; “hit to lead” strategies and new approaches for drug target deconvolution or vectorization will be favored. A particular attention will be given to candidates willing to create a group in biological NMR.

**Procedure & Calendar**
Application (about 5 pages in English) should include a cover letter describing previous research experience, an outline of the future research project, motivation for joining the institute and names and e-mail address of 3 referees, together with an updated CV (including a complete list of publications). Application should be sent to recruit@ipbs.fr in a single PDF file named LASTNAME_FIRSTNAME_IPBS2017.pdf. Other formats will not be considered.

**Application deadline:** July 15, 2017

The University of Toulouse and the IPBS value diversity and are committed to equal opportunities. The institute has the responsibility to ensure that all employees are eligible to live and work in France. Toulouse is at the heart of the southwest France, with a very large and dynamic community of students and scientists, several international-level research and clinical centers, and has been ranked among the first cities in France for its quality of life.

www.ipbs.fr
Tumor microenvironment – Cancer immunology

Deciphering the influence of different cellular components of the tumor microenvironment, such as high endothelial venules (HEVs), which are portals of entry for lymphocytes into tumor tissues, mature adipocytes, dendritic cells and macrophages, on tumor progression is one of the major topics developed at IPBS. In addition, molecular aspects of cell migration and integration of biophysical parameters (such as matrix stiffness) are also studied. These projects benefit from cutting-edge technological facilities for whole body, tissue and cellular imaging (including intravital microscopy), flow cytometry and cell sorting, DONALD super-resolution microscope) and mass-spectrometry. In order to strengthen this topic, we are looking for a junior group leader with a genuine interest in studying immune components of the cancer microenvironment. Projects dealing with the followings will be favored: interaction of immune cells with stromal cells, the extracellular matrix and/or other immune cells; immune response to cancer.

Selected publications from our research teams

- Bouissou et al. (2017) Podosome force generation machinery: a local balance between protrusion at the core and traction at the ring. ACS Nano

DNA repair or chromatin remodeling in cancer

Two teams, among the groups working on cancer at IPBS, investigate DNA transactions in pathological (ionizing radiations and clastogenic chemotherapeutic drugs) and physiological settings (antigen receptor rearrangements). Their respective projects highly benefit from collaborations with other IPBS teams specialized in NMR, structural biology and computer simulation, and from in-house core facilities such as proteomics, advanced light microscopy (two-photon microscopy), and animal facilities. In order to strengthen this research topic at IPBS, we are looking for a junior group leader using cutting-edge approaches in the DNA damage response (DDR) area, connected with cancer through epigenetics, transcriptional regulation, DNA repair pathologies, chromosomal translocations, DDR-based drug discovery, or tumor resistance to clastogenic agents.

Selected publications from our research teams

- Braikia et al. (2017) An inducible CTCF insulator delays the IgH 3’ regulatory region-mediated activation of germline promoters and alters class switching. PNAS

- Lamsoul et al. (2013) ASB2 regulates migration of immature dendritic cells Blood
- Bochet et al. (2013) Adipocyte-Derived Fibroblasts promote tumor progression and contribute to desmoplastic reaction in breast cancer. Cancer Res
- Girard et al. (2012) HEVs, lymphatics and homeostatic immune cell trafficking in lymph nodes. Nat Rev Immunol
- Mutton & Girard (2011) Dendritic cells control lymphocyte entry to lymph nodes via high endothelial venules Nature
Pulmonary infections

A large part of the IPBS research activity is dedicated to studying various aspects of tuberculosis and other lung infections. This includes lipid biochemistry and biogenesis of the mycobacterial cell envelope, virulence mechanisms and host-pathogen interactions, and immunity to mycobacteria and other lung pathogens. We are looking for a junior group leader in the field of pulmonary bacterial infection, with a strong focus on the biology of pathogens. Topics related to the followings will be favored: mechanisms underlying pathogen’s persistence, drug resistance or tolerance within the host. Deciphering the mechanisms of bacteria adaptation to their microenvironment will be a central question, and will benefit from state-of-the-art approaches including, but not restricted to, single cell analysis, omics, microscopy and structural biology. In particular, our BSL3 animal facilities are fully equipped tissue and cellular imaging (including multiphoton intravital microscopy) and flow cytometry and cell sorting.

Selected publications from our research teams

- Carel et al. (2017) Identification of specific posttranslational O-mycolyoylations mediating protein targeting to the mycomembrane. *PNAS*
- Troegeler et al. (2017) C-type lectin receptor DCIR modulates immunity to tuberculosis by sustaining type I interferon signaling in dendritic cells. *PNAS*
- Decout et al. (2017) Rational design of adjuvants targeting the C-type lectin Mincle. *PNAS*
- Boritsch et al. (2016) pks5-recombination-mediated surface remodelling in *Mycobacterium tuberculosis* emergence. *Nat Microbiol*
- Lastrucci et al. (2015) Tuberculosis is associated with expansion of a motile, permissive and immunomodulatory CD16+ monocyte population via the IL-10/STAT3 axis. *Cell Res*
- Blattes et al. (2013) Mannodendrimers prevent acute lung inflammation by inhibiting neutrophil recruitment. *PNAS*
- Liu et al. (2013) Bacterial protein-O-mannosylating enzyme is crucial for virulence of *Mycobacterium tuberculosis*. *PNAS*
- Botella et al. (2011) Mycobacterial P1-type ATPases mediate resistance to zinc poisoning in human macrophages. *Cell Host Microbe*

Drug discovery & structural biology

We are looking for a junior group leader in areas complementary to our current research portfolio, and with a significant synergistic effect towards the existing IPBS research teams. The objective is to further nurture our genuine commitment to novel drugs identification and development against cancer and infectious diseases. We encourage applications addressing dynamic aspects of interactions and networks at the molecular and cellular levels, with a strong ambition to develop the drugs of the future and to strengthen the pharmacological aspects of the IPBS research framework. Topics related to structural biology, “hit to lead” strategies and new approaches for drug target deconvolution or vectorization will be favored. A particular attention will be given to candidates willing to create a group in biological NMR (in liquid- or solid-state NMR).

Selected publications from our research teams

- Saurel et al. (2017) Local and global dynamics in *Klebsiella pneumoniae* outer membrane protein a in lipid bilayers probed at atomic resolution. *J Am Chem Soc*
- O’Connor et al. (2015) NMR structure and dynamics of the agonist dynorphin peptide bound to the human kappa opioid receptor. *PNAS*
- Brunet et al. (2015) Probing a label-free local bend in DNA by single molecule tethered particle motion. *Nucleic Acids Res*
- García-Alles et al. (2011) Structural reorganization of the antigen-binding groove of human CD1b for presentation of mycobacterial sulfoglycolipids. *PNAS*
- García-Alles et al. (2011) The crystal structure of CD1e reveals a groove suited for lipid exchange processes. *PNAS*
- Paganin-Gioanni et al. (2011) Direct visualization at the single-cell level of siRNA electrotransfer into cancer cells. *PNAS*